

# Person-Counter

# What Is It For?

Imagine you're in an Amusement Park. You wish to check out several of its attractions spreading throughout the entire park, but at the same time you don't want to stand in line more than absolutely necessary. How will you plan your time?

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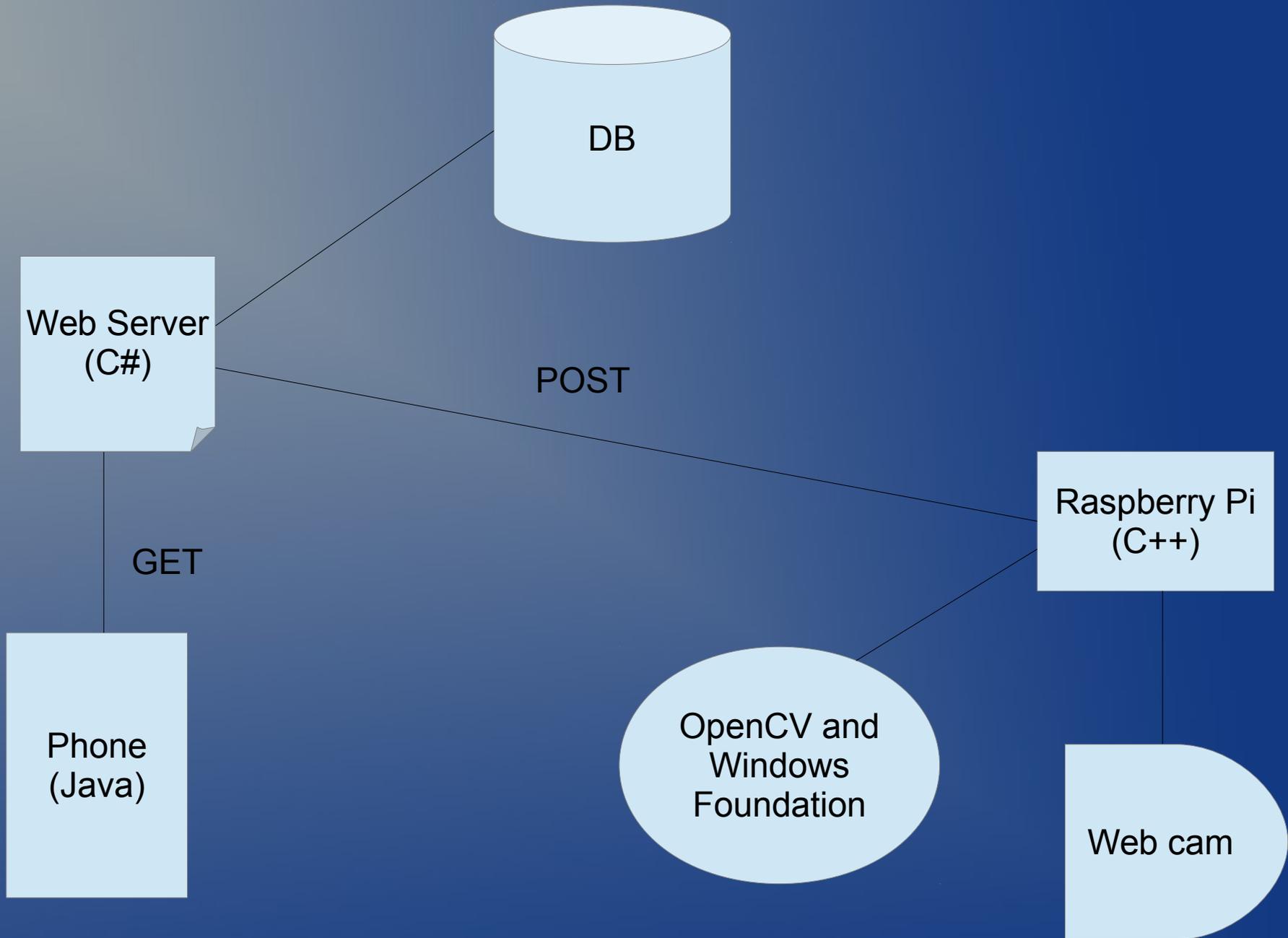
Now imagine you could know in any given moment how many people are currently standing at each line. That would surely help immensely.

# Introducing Person-Counter

Using Computer Vision algorithms we can now count the number of people going in and out of a specified zone and report those numbers directly to your smart phone. With only one click you will know where the line is shortest, and what is the rate in which it moves.

# How Does It Work?

Both at the start and at the end of each line, a person-counter will be positioned. The person counter will capture images of people going in and out of the line, and when they do it will send a signal to a cloud which will update a counter. A client can then use the app to ask the cloud how many people are currently standing in a certain line, and the cloud will send back a response.



# The Raspberry Pi

The Raspberry Pi client program is an embedded plug and play program in c++ which permits the raspberry to be ran easily and quickly without much expert client interaction.

The Raspberry Pi is compiled with a unique serial number and a machine name which will be stamped for its entire lifespan, for server identification.

The Raspberry Pi is enhanced with an OpenCV detection algorithm that permits it to perform various client customized operations on camera frames, such as capturing, saving, analyzing and more.

# The Raspberry Pi

In our specific project, we programmed the Raspberry Pi to use a camera to capture image frames and analyze them for motion detection and blob object counting in a waiting line. The results of the analysis report directly to the web app through an HTTP POST request which includes reported data and encrypted serial number for identification.

# Server Side

The server side is based upon the Azure domain which hosts the web app and the database components.

The web app at [people-count.azurewebsites.net](https://people-count.azurewebsites.net) listens to HTTPS traffic using our crafted servlet which provides service over HTTPS to GET and POST requests while performing the necessary security measures to avoid attacks such as SQL injection, DDOS and identity counterfeit.

The database is mainly used to keep track of every entry we need in order to provide the relevant service. The only component that may interact and query the database is the web servlet.

# Mobile App

The mobile app is a “read-only” platform which lets any user who has the app installed on his smart phone to monitor and review the status of desired waiting line. The mobile app may perform actions of its own such as finding the machine with minimal waiting time or minimum attending people in line and so on.

The app is simple, it receives the list of all active machines on application load, and then the user is free to interact with the intuitive GUI.

Thank You  
(Questions?)